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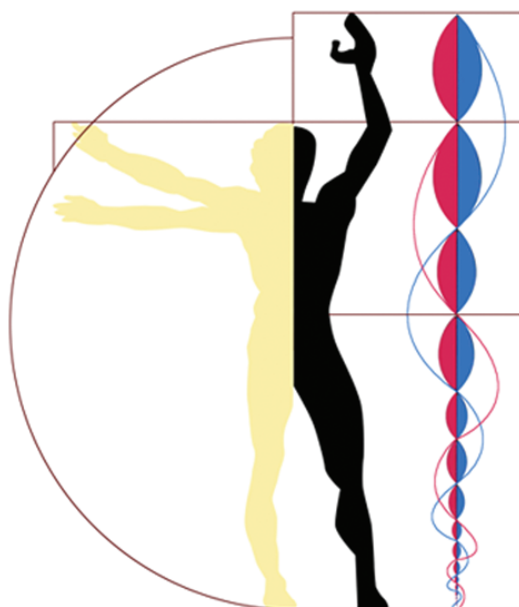
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Fabbrica della Conoscenza

XIII Forum Internazionale di Studi

Le Vie dei  
Mercanti

Carminé Gambardella



# HERITAGE and TECHNOLOGY

Mind Knowledge Experience



**Fabbrica della Conoscenza numero 56**  
Collana fondata e diretta da Carmine Gambardella

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# **HERITAGE and TECHNOLOGY Mind Knowledge Experience**

Le Vie dei Mercanti \_ XIII Forum Internazionale di Studi

Carmine Gambardella

## **HERITAGE and TECHNOLOGY**

### **Mind Knowledge Experience**

Le Vie dei Mercanti

XIII Forum Internazionale di Studi

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Il Progetto “Ecoturismo urbano per la fruizione sostenibile dei Beni Culturali in Campania”, in attuazione degli Obiettivi Operativi 2.1 e 2.2 del Programma Operativo FESR Campania 2007/2013 per la realizzazione e/o il potenziamento, nel territorio della regione, di forti concentrazioni di competenze scientifico tecnologiche, di alto potenziale innovativo, intende favorire la concentrazione di competenze scientifico-tecnologiche finalizzata a rafforzare la competitività dei sistemi locali e delle filiere produttive regionali non solo nei settori dei servizi associati al turismo e beni culturali ma anche in settori ad altissima tecnologia che possano rappresentare una svolta tecnologica e culturale all'approccio innovativo per lo Sviluppo sostenibile in aree ad altissima vocazione turistica.

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**Tangible and intangible dimensions**  
**History**  
**Culture**  
**Collective Identity**  
**Memory**  
**Documentation**  
**Management**  
**Communication for Cultural Heritage**  
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**Territorial Surveying**  
**Landscape Projects**  
**Environmental Monitoring**  
**Government of the Territory**  
**Sustainable Development**





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**Peer review**

Scholars has been invited to submit researches on theoretical and methodological aspects related to Heritage and Technology, and show real applications and experiences carried out on this themes.

Based on blind peer review, abstracts has been accepted, conditionally accepted, or rejected.

Authors of accepted and conditionally accepted papers has been invited to submit full papers. These has been again peer-reviewed and selected for the oral session and publication, or only for the publication in the conference proceedings.

**Conference report**

357 abstracts received from:

Albania, Argentina, Australia, Benin, Brazil, Bulgaria, Canada, Croatia, Egypt, France, Greece, Iraq, Israel, Italy, Japan, Latvia, Malta, Mexico, Norway, Poland, Portugal, P.R. China, Russia, Slovakia, Spain, Turkey, United Kingdom, USA.

More than 500 authors involved.

291 papers published.

## Table of contents

P. 35	Preface <b>Carmine GAMBARDELLA</b>
P. 36	<b>ID 002</b> Architectural Restoration projects in metropolitan areas: the case of the Su-pyo Bridge <b>Beniamino POLIMENI</b>
P. 46	<b>ID 003</b> Windows of memory: perspective panels to communicate archeological heritage <b>Alessandra PAGLIANO, Mariano MARMO, Roberta MONTELLA, Angelo TRIGGIANESE</b>
P. 55	<b>ID 004</b> Heritage enhancement and communication: "Palazzo Te allo Specchio" follow-up <b>Alessandro BIANCHI</b>
P. 64	<b>ID 007</b> Influences of building techniques on the annual primary energy requirement of buildings in Frignano (Italy) <b>Luigi MOLLO</b>
P. 69	<b>ID 008</b> The sentry of Castellino Tanaro: the structural recovery of an ancient medieval tower <b>Cesare Renzo ROMEO</b>
P. 77	<b>ID 010</b> Environmental monitoring of electromagnetic fields of urban territory of Samara Region of Russia <b>Andrey VASILYEV</b>
P. 85	<b>ID 011</b> Methods and results of environmental monitoring of soil pollution by oily waste <b>Andrey VASILYEV, Dmitry E. BYKOV, Andrey A. PIMENOV</b>
P. 90	<b>ID 012</b> Approaches to soil treatment from oily products and results of its approbation <b>Andrey VASILYEV, Vlada V. ZABOLOTSKIKH</b>
P. 95	<b>ID 013</b> Besides the design: the analysis and documentation of the ancient "Via Pretoria" in Potenza. The most significant transformations of a Roman road axis in the historic city <b>Enza TOLLA, Antonio BIXIO, Giuseppe DAMONE</b>
P. 104	<b>ID 014</b> Referential interpretation of vernacular heritage in recent architectural design <b>Emrah ASLAN, Dogan Sevinc ERTUR, Zafer ERTURK</b>
P. 114	<b>ID 015</b> Teaching and Practice of Architecture in Recife (Brazil) 1959 – 2009 <b>Enio LAPROVITERA DA MOTTA</b>
P. 124	<b>ID 016</b> The Architect and the People of Recife (Brazil): 1959 – 2009 <b>Enio LAPROVITERA DA MOTTA</b>

- P. 132**      **ID 018**  
Student-Centred Learning as an Approach to Design Primary Schools' Outdoors  
**Doaa HASSAN**
- P. 143**      **ID 019**  
Superkilen, Copenhagen  
**Mario PISANI**
- P. 151**      **ID 020**  
Revitalisation of historical landscape areas in UNESCO city of Banská Štiavnica  
**Ingrid BELČÁKOVÁ**
- P. 158**      **ID 022**  
Retrofit and conservation of historical concrete buildings in Turin (Italy)  
**Alessandro P. FANTILLI, Barbara FRIGO, Bernardino CHIAIA**
- P. 166**      **ID 024**  
Turin in 1815  
**Nadia FABRIS**
- P. 174**      **ID 026**  
The new and the old in the perception of cultural heritage. The language of innovative materials between conservation, protection and enjoyment  
**Gigliola AUSIELLO**
- P. 181**      **ID 027**  
The traditional sacral wooden construction in Lithuania. An illustrated catalogue of building techniques for the safeguard and recovery of cultural heritage  
**Liucija BEREŽANSKYTĖ, Tiziana CAMPISI**
- P. 191**      **ID 029**  
Public buildings in the construction tradition of the 20<sup>th</sup> -century Italian suburbs  
**Alessandro CAMPOLONGO**
- P. 199**      **ID 030**  
Projectivity and the homological relationship as a verification of the computer mathematical representation: the representation of plane and skew curves in graphical models.  
**Antonio MOLLICONE**
- P. 210**      **ID 031**  
New urban models | San Pablo case /// 'Luis Buñuel'  
**José Javier GALLARDO ORTEGA**
- P. 218**      **ID 032**  
Designing by strata: notes from the underground. Hypogeous spaces and the archeological museum of Pompei  
**Corrado DI DOMENICO**
- P. 228**      **ID 038**  
Cover, overlapping and layering: protection and promotion of archaeological heritage in Paris  
**Alice PALMIERI**
- P. 238**      **ID 039**  
The other side of the Ring-Bruxelles  
**Rosalba DE FELICE**
- P. 248**      **ID 040**  
Metropolitan cities of Italy: law, environment and sustainable development  
**Michele RUSSO**



- P. 257**      **ID 041**  
Urban landscape and new venustas  
**Salvatore LOSCO**
- P. 266**      **ID 043**  
The Technology of an Early Reinforced Concrete Structure in Turkey: The Great Storehouse of the Kayseri Sümerbank Textile Factory (1932-1935)  
**Nilüfer BATURAYOĞLU YÖNEY, Burak ASİLİSKENDER**
- P. 275**      **ID 044**  
Fedele Fischetti and the Gallery of Real Casino Carditello  
**Antonella DIANA**
- P. 283**      **ID 045**  
Contemporary design drawings as cultural heritage: interpretation and communication. Towards a digital archive of Rosani's industrial projects  
**Roberta SPALLONE, Francesca PALUAN**
- P. 293**      **ID 046**  
Exploring and interpreting the landscape using technological innovative systems  
**Giacinto TAIBI, Rita VALENTI, Mariangela LIUZZO**
- P. 302**      **ID 047**  
Architecture and subtraction: Ostiense square in Rome  
**Assunta NATALE**
- P. 312**      **ID 048**  
Surveying for documentation and management the Renaissance building of Royal Hospital in Granada (Spain)  
**Juan Francisco REINOSO-GORDO, José Luis RAMÍREZ-MACÍAS, Francisco Javier ARIZALÓPEZ, Carlos LEÓN-ROBLES, Antonio GÓMEZ-BLANCO, Concepción RODRÍGUEZMORENO, Íñigo ARIZA-LÓPEZ**
- P. 318**      **ID 049**  
Data quality elements for BIM applied to heritage monuments  
**Íñigo ARIZA-LÓPEZ, Francisco Javier ARIZA-LÓPEZ, Juan Francisco REINOSO-GORDO, Antonio GÓMEZ-BLANCO, Concepción RODRÍGUEZ-MORENO, Carlos LEÓN-ROBLES**
- P. 326**      **ID 050**  
San Francisco Schools, 1839. Virtual reconstruction of The Franciscan convent of Betanzos and its transformations, in the XIX Century. (Galicia, Spain)  
**Marta COLÓN, Fernando FRAGA**
- P. 336**      **ID 051**  
Wandering Experience in Napoli  
**Idit GOLDFISHER, Shani ZIV, Talila YEHIEL**
- P. 343**      **ID 052**  
The representation of the memory: the analogic-digital survey of two funeral monuments in the Verano cemetery of Rome  
**Laura CARNEVALI, Fabio LANFRANCHI, Mariella LA MANTIA**
- P. 353**      **ID 053**  
Archaeology and architectural design. New studies and projects for the Acropolis of Athens  
**Luisa FERRO**
- P. 363**      **ID 054**  
Multilevel planning regional management. A GIS Platform Structure  
**Francesco ZULLO, Serena CIABO', Lorena FIORINI, Alessandro MARUCCI, Simona OLIVIERI, Stefano PERAZZITTI, Bernardino ROMANO**

- P. 372**      **ID 055**  
 “col cerviello et non con le mani” New hypotheses on the Michelangelo plaster works of the Fine Arts Academy of Perugia  
**Paolo BELARDI, Luca MARTINI, Michele MARTORELLI**
- P. 382**      **ID 056**  
 The lost imperial palace of Antioch on the Orontes (now Antakya, Turkey)  
**Stefano BORSI**
- P. 387**      **ID 058**  
 New technologies for knowledge and the physical space of the museum  
**Gioconda CAFIERO**
- P. 396**      **ID 059**  
 A pyramidal kitchen vault in a gothic-renaissance palace. Oliva, Valencia, Spain  
**Alba SOLER ESTRELA, Rafael SOLER VERDÚ, Manuel CABEZA GONZALEZ**
- P. 404**      **ID 060**  
 LANDY. LANDscape DYnamics. Survey, representation, monitoring and communication of the dynamics of the landscape and risks related to them  
**Enrico CICALÒ1, Maurizio Minchilli, Loredana Tedeschi, Mara Balestrieri, Gianfranco Capra, Alessandra Casu, Arnaldo Cecchini, Tanja Congiu, Raffaella Lovreglio, Antonella Lugliè, Giuseppe Onni, Bachisio Mario Padedda, Paola Pittaluga, Clara Pusceddu, Paola Rizzi, Nicola Sechi, Silvia Serreli, Sergio Vacca**
- P. 409**      **ID 061**  
 A strategic plan of investigation into the urban areas carried out together with public bodies  
**Giacinto TAIBI, Rita VALENTI, Michele LIISTRO, Sebastiano GIULIANO**
- P. 418**      **ID 062**  
 Reticular valorization model for castles in Central-Eastern Europe. The Slovak experience  
**Mirko CAPUTO**
- P. 428**      **ID 063**  
 Methods and Techniques “to work on the built”  
**Maria Antonia GIANNINO**
- P. 435**      **ID 064**  
 Villa Cambi – the discovery of an unpublished posthumous building of G. Michelucci realized by B. Sacchi  
**Frida BAZZOCCHI, Vincenzo DI NASO, Andrea MASI, Charles Michael STARNINE**
- P. 445**      **ID 065**  
 “Sensing to the past” like a new paradigm: knowledge and experience on fortified architectures  
**Alessandra QUENDOLO, Claudia BATTAINO, Maria Paola GATTI**
- P. 455**      **ID 067**  
 Introduction to the study of the Apice territory.  
**Assunta CAMPI**
- P. 465**      **ID 068**  
 Unveilings. Mnemonic project of the archaeological invisible landscapes  
**Claudia BATTAINO, Luca ZECCHIN**
- P. 475**      **ID 069**  
 UAV surveys for representing and document the cultural heritage  
**Mauro CAPRIOLI, Francesco MANCINI, Francesco MAZZONE, Mario SCARANO, Rosamaria TRIZZINO**

- P. 483**      **ID 070**  
The environmental engineering in Vesuvius National Park  
**Ferdinando ORABONA**
- P. 490**      **ID 072**  
Methodological study on the application of the stratigraphic analysis to the New Towns of the Middle Age  
**Barbara BONGIOVANNI**
- P. 498**      **ID 074**  
The immaterial city. An innovative look at the unrealized projects for 20th century Spoleto  
**Valeria MENCHETELLI, Laura NARDI, Giovanna RAMACCINI**
- P. 508**      **ID 075**  
Planning dimension of restoration  
**Antonluca DI PAOLA**
- P. 513**      **ID 078**  
A dialogue between architecture and technology. Methodological processes for the knowledge and preservation of buildings of value in the eastern part of Sicily  
**Giacinto TAIBI, Rita VALENTI, Sebastiano GIULIANO, Emanuela PATERNÒ**
- P. 521**      **ID 079**  
Morphological Investigations and Virtual Reconstructions of the Domus of the Northeast Quarter of Volubilis (Morocco)  
**Concepcion RODRIGUEZ-MORENO, Jose Antonio FERNANDEZ-RUIZ**
- P. 531**      **ID 080**  
A model of strategies used for traffic calming in an urban environment  
**Alma AFEZOLLI, Elfrida SHEHU**
- P. 541**      **ID 081**  
Cultural heritage confiscated from racketeering. A course toward adaptive reuse and effective management  
**Stefania DE MEDICI**
- P. 551**      **ID 082**  
Tighremt Aslim\_ Aguddim Taliwin: cases study in the Draa Valley  
**Marinella ARENA**
- P. 560**      **ID 083**  
The management of private properties with heritage values  
**Elfrida SHEHU, Alma AFEZOLLI**
- P. 569**      **ID 084**  
Pompeii - World Heritage Site: the buffer zone urban structures and spaces of collective interest  
**Enrico DE CENZO, Giovanni BELLO**
- P. 579**      **ID 085**  
Building techniques in the Umbrian Middle Ages: from history to conservation  
**Eleonora SCOPINARO**

- P. 588**      **ID 086**  
Development of a GIS environment for archaeological multipurpose applications: the Fano historic centre  
**Roberto PIERDICCA, Eva Savina MALINVERNI, Paolo CLINI, Adriano MANCINI, Carlo Alberto BOZZI, Paolo CLINI, Romina NESPECA**
- P. 598**      **ID 089**  
HISTORY BUILDS, SURVEYING RE-BUILDS: conservation work of a medieval building through the representation of its (most likely) construction history.  
**Hilde Grazia Teresita ROMANAZZI**
- P. 607**      **ID 091**  
Design + Nursing: From laboratories to Users, The Transformation of Concussion Prevention  
**Steven DOEHLER, Roberta LEE, Jeanine GOODEN, Jean ANTHONY, Kimberly HASSELFELD**
- P. 615**      **ID 092**  
Oscar Niemeyer, the architect of the curve surfaces. The freehand relief as tool for investigation of modern Brazilian architecture  
**Domenico SPINELLI**
- P. 623**      **ID 093**  
Survey on the landscape and morphological singularities of the Cliff of Aci Castello  
**Mariangela LIUZZO, Sebastiano GIULIANO, Salvatore SAVARINO**
- P. 632**      **ID 094**  
The use of external claddings in the functional recovery of disused industrial buildings.  
**Giulia MATERAZZI, Nicola CAVALAGLI, Vittorio GUSELLA**
- P. 641**      **ID 095**  
Structure and stone cladding in building constructions in L'Aquila, Abruzzo, Italy, from the 12th to the 18th century: methods used for the analysis and indexing of masonry categories and related performances in response to seismic activities  
**Stefano CECAMONE**
- P. 650**      **ID 096**  
Structural calculations by horizontal and vertical interoperability for the redevelopment of existing buildings  
**Bernardino CHIAIA, Sanaz DAVARDOUST, Anna OSELLO**
- P. 659**      **ID 097**  
Cultural built heritage in cemeteries, between architecture and urban design. The Serramanna Cemetery Chapel  
**Vincenzo BAGNOLO**
- P. 666**      **ID 098**  
The single hall churches in the historic centre of Catania (Italy): a cognitive method behind the design of sustainable refurbishment.  
**Alessandro LO FARO, Attilio MONDELLO, Angelo SALEMI**
- P. 676**      **ID 099**  
Unveiling a heritage through digital enlightenment: the Lisbon Royal Opera House of Tagus  
**Pedro Miguel Gomes JANUÁRIO, Maria João Mendonça Pereira NETO, Mário Say Ming KONG**

- P. 686**      **ID 100**  
Heritage and technology: novel approaches to 3D documentation and communication of architectural heritage  
**Mariateresa GALIZIA, Laura INZERILLO, Cettina SANTAGATI**
- P. 696**      **ID 101**  
Aljezur, “between vision” of Place and Memory: The use of new technologies for the protection of a place and its heritage  
**Maria João Pereira NETO, Pedro Gomes JANUÁRIO, Mário Say Ming KONG, Raffaella MADDALUNO**
- P. 701**      **ID 102**  
Building Color Survey of Four Districts for Preserving a Group of Traditional Buildings in Japan  
**Kiwamu MAKI**
- P. 709**      **ID 103**  
Experience, Immersion and Perception: Communication Design for Urban and Natural Environments  
**Daniela CALABI, Elisa CHIODO, Sabrina SCURI**
- P. 718**      **ID 104**  
Pompeii - Nature and Architecture  
**Clelia CIRILLO, Luigi SCARPA, Giovanna ACAMPORA, Barbara BERTOLI, Raffaella ESPOSITO, Marina RUSSO**
- P. 729**      **ID 105**  
Galeazzo Alessi: narration, representation and contemporary theatricality for XVI c. architectural heritage  
**Maria Linda FALCIDIENO, Massimo MALAGUGINI, Maria Elisabetta RUGGIERO**
- P. 739**      **ID 106**  
A Geographic Information System for the documentation of the medieval and modern fortifications. The district of "Castello" in Cagliari.  
**Andrea PIRINU**
- P. 747**      **ID 107**  
Building in / Building on. Composition strategies for re-conversion of productive buildings  
**Gaspere OLIVA**
- P. 757**      **ID 108**  
The intangible visuality of invisible cultural landscapes. The aerial view for the knowledge of the past.  
**Davide MASTROIANNI**
- P. 766**      **ID 112**  
The roles of industrial heritage areas on urban renewal: the case of “Ödemiş”  
**Julide KAZAS PEKCAN**
- P. 777**      **ID 113**  
St. Erasmus in Isernia: a medieval cave church  
**Piero BARLOZZINI**
- P. 784**      **ID 115**  
Implications of earthquake return periods on the building quality  
**Sandra TONNA, Claudio CHESI**

- P. 794**      **ID 116**  
Architectural History from a Performance Perspective. The Latent Potential of Knowledge embedded in the Built Environment  
**Michael HENSEL, Defne SUNGUROĞLU HENSEL**
- P. 803**      **ID 117**  
The underground city between design and survey: the greek hollow of Poggioreale  
**Maria Ines PASCARIELLO, Raffaele MARTINELLI**
- P. 813**      **ID 120**  
Strategies for the building stone and damage mapping applied to the historical center of Catania  
**Giulia SANFILIPPO, Angelo SALEMI, Erica AQUILIA, Germana BARONE, Paolo MAZZOLENI, Angelo SALEMI**
- P. 823**      **ID 121**  
The invisible roads of contemporary businesses  
**Agostino URSO**
- P. 833**      **ID 122**  
Fragments and memory of landscape: preservation of some fragile architectures  
**Emanuele ROMEO, Emanuele MOREZZI, Riccardo RUDIERO**
- P. 842**      **ID 123**  
Development of the urban-rural network in the metropolitan area of the Strait of Messina through the recovery of the historical and cultural obsolete heritage.  
**Alessandra MANIACI, Gianfranco SALEMI SCARCELLA**
- P. 851**      **ID 125**  
Revisiting residential architecture in the city of João Pessoa, Paraíba, Brazil  
**Maria Berthilde MOURA FILHA, Ivan CAVALCANTI FILHO**
- P. 860**      **ID 127**  
Development of a database using GIS technology: study and intervention in vulnerable neighbourhoods  
**AGUSTÍN HERNÁNDEZ, Miguel SANCHO MIR, Noelia CERVERO SANCHÉZ**
- P. 869**      **ID 128**  
Development of indicators to graphically and geometrically define state subsidised residential blocks in Zaragoza. Spain. Geometrical exposure to sun.  
**Aurelio VALLESPIN MUNIESA, Angélica FERNÁNDEZ MORALES, Zaira PEINADO CHECA**
- P. 878**      **ID 130**  
Integrated methodologies for documentation and restoration of Modern architecture: survey and representation of the “Casa das Canoas” by Niemeyer  
**Marcello BALZANI, Federica MAIETTI**
- P. 888**      **ID 131**  
Three-dimensional morphometric database for visualisation and critical analysis of the San Sebastiano in Mantua by Leon Battista Alberti  
**Marcello BALZANI, Federico FERRARI**
- P. 896**      **ID 133**  
Restoration works and valorization strategies of the architectural complex of S. Francesco in Amantea (CS)  
**Renato OLIVITO, Alessandro TEDESCO**

- P. 906**      **ID 134**  
Realistic 3D view as a form of interpretation and presentation of historic gardens  
**Ivan STANKOCI, Tamara REHÁČKOVÁ**
- P. 915**      **ID 135**  
Augmented reality for the understanding of cultural heritage. The case study of the monument of Giuseppe Sirtori in Milan  
**Carlo BATTINI**
- P. 920**      **ID 136**  
Adjustments. Repairing and reinventing damaged landscapes  
**Fabrizia IPPOLITO**
- P. 926**      **ID 138**  
The Recovery of Urban Post-War Landscape Middle-Class Housing in Naples  
**Chiara INGROSSO, Luca MOLINARI**
- P. 932**      **ID 139**  
Guidelines for the drafting of Maintenance plan dedicated to Archaeological Heritage: case-study Villa di Poppea, Oplonti  
**Maria Rita PINTO, Flavia LEONE**
- P. 941**      **ID 141**  
The Influence of Colouring on Style Expression of Industrial Architecture  
**Eva BELLÁKOVÁ, Eva ŠPERKA**
- P. 949**      **ID 143**  
The role of non invasive diagnosis for preventive archaeology in the frame of projects of industrial and energetic plants.  
**Pasquale MARINO**
- P. 953**      **ID 144**  
Sustainable development of hospital structures  
**Marsida TUXHARI, Denada VEIZAJ**
- P. 960**      **ID 145**  
World heritage and technology, the different understanding  
**Christina RAIDESTINO APERGI**
- P. 968**      **ID 151**  
Utility and necessity in architecture: design, construction and transformation of alpine buildings  
**Maria Paola GATTI, Giorgio CACCIAGUERRA, Andrea DONELLI**
- P. 976**      **ID 152**  
Use of TLS technology for the fem-based structural analysis of the anatomy theatre  
**Alberto GUARNIERI, Andrea MASIERO, Livia PIERMATTEI, Francesco PIROTTI, Antonio VETTORE**
- P. 984**      **ID 153**  
A planning & design approach for the rehabilitation of historic centres in Iraq  
**Giuseppe CINÀ**
- P. 997**      **ID 154**  
Survey of Architecture. Complex models for analysis, valorisation, restoration  
**Aldo DE SANCTIS**

- P. 1004**      **ID 155**  
The Industrial Building Heritage: first steps for the Damages Evaluation of Innocenti-Maserati Strucutral Plants  
**Pietro CRESPI, Alberto FRANCHI, Paola RONCA, Antonio MIGLIACCI, Alessandro ZICHI**
- P. 1012**      **ID 156**  
In-situ tests, analytical and numerical studies for the assessment capacity of a historic building in l'Aquila  
**Alberto FRANCHI, Pietro CRESPI, Paola RONCA, Nicola GIORDANO, Giulia RANSENIGO**
- P. 1020**      **ID 157**  
The Trezzo sull'Adda's Castle: restoration consolidation and reuse of the Cultural Heritage for a sustainable future use.  
**Pietro CRESPI, Fausto NEGRI, Giovanni FRANCHI, Paola RONCA, Alessandro ZICHI**
- P. 1027**      **ID 158**  
A methodology able to investigate the phenomenon of Unauthorized building: the case of Giugliano in Campania  
**Claudia DE BIASE**
- P. 1037**      **ID 159**  
Landscapes of repentance and of compensation  
**Esther GIANI**
- P. 1043**      **ID 160**  
From the knowledge process to the representation of the built environment. The case of the "Istituto del Rifugio" in Naples  
**Lia Maria PAPA, Pierpaolo D'AGOSTINO, Giuseppe ANTUONO**
- P. 1051**      **ID 162**  
Which survey for which digital model: critical analysis and interconnections.  
**Andrea GIORDANO, Paolo BORIN, Maria Rosaria CUNDARI**
- P. 1059**      **ID 163**  
3D modelling in Architecture: from tangible to virtual model  
**Tatiana KIRILOVA KIROVA, Davide MEZZINO**
- P. 1074**      **ID 165**  
Innovation and Creativity of Architectural as a tool to Confrontation and Observation the Changes in the Mosque Architecture During Different Eras  
**Wafeek Mohamed Ibrahim MOHAMED**
- P. 1094**      **ID 166**  
An online multilingual dictionary as a technology platform for heritage studies and development  
**Monika BOGDANOWSKA**
- P. 1101**      **ID 167**  
Geophysics and Cultural Heritage  
**Pier Matteo BARONE, Carlotta FERRARA**
- P. 1111**      **ID 168**  
The architectonic perspectives in the villa of Oplonti: a space over the real  
**Barbara MESSINA, Maria Ines PASCARIELLO**



- P. 1121**      **ID 170**  
Investigations on building techniques of the defensive walls in Kınık Höyük excavation (Turkey)  
**Valentina CINIERI, Emanuele ZAMPERINI, Marco MORANDOTTI**
- P. 1131**      **ID 171**  
Surveying and Restoration of St. Basilio Monastery in L'Aquila  
**Mario CENTOFANTI, Stefano BRUSAPORCI, Francesca CERASOLI**
- P. 1140**      **ID 172**  
A system for dating changes in building fabric via nail spectra  
**Chris HOW**
- P. 1150**      **ID 173**  
The aesthetic vision of the landscape in nineteenth century Piedmontese painting  
**Anna CIOTTA**
- P. 1159**      **ID 174**  
Grotesque forms and representations in baroque balconies of eastern Sicily.  
**Caterina GULLO**
- P. 1166**      **ID 176**  
The water and its monuments in Provence  
**Laura BLOTTO**
- P. 1176**      **ID 178**  
Knowledge and innovation in the field of Cultural Heritage  
**Caterina GATTUSO**
- P. 1180**      **ID 179**  
Cultural Heritage 2.0. Toward innovative tools for the communication of cultural and historical asset.  
**Stefano ZAGGIA, Angelo BERTOLAZZI, Federico PANAROTTO**
- P. 1188**      **ID 180**  
Self Explaining City  
**Luigi STENDARDO, Raffaele SPERA, Angelo BERTOLAZZI**
- P. 1298**      **ID 181**  
Protection of Cultural Heritage on the Example of Krakow Tenement Houses from the End of the 19th and the Beginning of the 20th Century  
**Beata MAKOWSKA**
- P. 1203**      **ID 182**  
Urban presence: the fountain  
**Federica CAPRIOLO**
- P. 1210**      **ID 183**  
Structural analysis of finite element models of masonry balconies and overhangs obtained by B.I.M.  
**Ingrid TITOMANLIO Giuseppe FAELLA**
- P. 1218**      **ID 184**  
Building Information Modeling for the static and seismic safety of masonry balconies and overhangs  
**Ingrid TITOMANLIO**

- P. 1227**      **ID 185**  
Construction of the Museum of Fine Arts in Riga (1903-1905)  
**Arturs LAPINS**
- P. 1233**      **ID 186**  
The Impressionist Range Of Creativity And Technical Innovation Of The Heritage Cities  
Between Cosmic And Heritage Concept And Reformulation Of The Mental Image  
**Wafeek Mohammed Ibrahim MOHAMED**
- P. 1249**      **ID 187**  
A tower for Shanghai  
**Anna MANDIA**
- P. 1252**      **ID 188**  
Protecting unpopular heritage. The difficulties of listing 1950s architecture and postwar planning  
in Plymouth, UK  
**Daniel BARRERA FERNÁNDEZ**
- P. 1261**      **ID 189**  
Sharing knowledge, grasping Cultural Heritage: a digital multidisciplinary approach to the  
historical process of architecture and urban changes  
**Rosa TAMBORRINO, Fulvio RINAUDO**
- P. 1271**      **ID 190**  
Algorithmic transformation between heritage and innovation in design  
**Michela ROSSI, Giorgio BURATTI**
- P. 1279**      **ID 191**  
Structure and geometry  
**Vito Maria Benito VOZZA**
- P. 1289**      **ID 195**  
The redraw of the architecture in the smart city  
**Vito Maria Benito VOZZA Luigi CORNIELLO**
- P. 1299**      **ID 196**  
Architecture as living sculpture.  
**Stefania DI DONATO**
- P. 1309**      **ID 197**  
Bathing facilities: memory and survey of a forgotten coastal heritage  
**Antonella SALUCCI**
- P. 1317**      **ID 199**  
Representing the time: the role of sequences representation in the design of visual information  
**Stefano CHIARENZA**
- P. 1326**      **ID 200**  
Hollow clay elements of typical Calabrian tradition: typologies and construction techniques  
**Renato Sante OLIVITO, Caterina GATTUSO, Carmelo SCURO**
- P. 1333**      **ID 201**  
Best practice or bad practice? Technological perspectives, Administrative proceedings and  
urban perceptions in the historic cities: the case of Royal Arsenals of Seville.  
**Daniela LALLONE, Fernando AMORES**

- P. 1343**      **ID 202**  
Analysis of ecological criteria for traditional housing and its adaptation to new housing design  
**Ebubekir GÜNDOĞDU, Emel BİRER**
- P. 1353**      **ID 203**  
Technologies to know and share the Cultural Heritage between East and West: geometric patterns in the decorations  
**Anna MAROTTA**
- P. 1363**      **ID 205**  
Identity+Innovation: how to give hope and opportunities to forgot suburbs. A comparative study between EU and China.  
**Tiziano CATTANEO, Yongjie SHA, Emanuele GIORGI, Giorgio Davide MANZONI**
- P. 1373**      **ID 206**  
Not restoration but plannet and preventive conservation  
**Barbara SCALA**
- P. 1383**      **ID 208**  
Construction site information modelling and operational planning  
**Manuele CASSANO, Marco Lorenzo TRANI, Stefano DELLA TORRE, Benedetta BOSSI**
- P. 1393**      **ID 209**  
Key Enabling Technologies for an accessible Cultural Heritage: methods of application of the EU 2014-20 Programme strategy for Culture  
**Valeria DI FRATTA, Valeria AMORETTI**
- P. 1403**      **ID 210**  
Environmental protection versus simplification and development policy: searching for a difficult (but achievable) balance  
**Marco CALABRO'**
- P. 1411**      **ID 211**  
Wayfinding Accessible Design  
**Roberto DE PAOLIS, Silvia GUERINI**
- P. 1421**      **ID 213**  
A style between two centuries: the Great Hall of the Faculty of Architecture of Rome  
**Laura CARNEVALI, Giovanni Maria BAGORDO**
- P. 1427**      **ID 214**  
The rehabilitation of the school building heritage in Potenza (Italy)  
**Ippolita MECCA, Tiziana CARDINALE**
- P. 1436**      **ID 215**  
Cultural Heritage communication between narrative and creativity. 3D Video Mapping Projection and new suggestions of Augmented Space  
**Iolanda DI NATALE, Alice PALMIERI**
- P. 1446**      **ID 216**  
Urban symbiotic architecture in Pavia. The origins of Giancarlo De Carlo's Building Development Plan for Pavia University  
**Simone LUCENTI, Emanuele ZAMPERINI**
- P. 1456**      **ID 217**  
Different futures in the labyrinth of the carto-iconographical heritage of Milan  
**Maria Pompeiana IAROSSE, Sara CONTE, Marco INTROINI**

- P. 1465**      **ID 218**  
Ancient villages: the Eco-museums to Eno-museums  
**Francesca MUZZILLO, Fosca TORTORELLI**
- P. 1471**      **ID 219**  
Pompei between Archaeology and "Agritecture"  
**Fosca TORTORELLI**
- P. 1476**      **ID 222**  
Conservation Practices in Turkey in Last Decade, Two Monuments from Two Eras: the 4th-Century Laodikeia Church and the 16th-Century Rabi Madrasa  
**Ege Uluca TUMER**
- P. 1485**      **ID 224**  
Intersecting lives: Giovanni Battista Naldini and Giovanni Antonio Dosio  
**Antonella MARCIANO**
- P. 1495**      **ID 225**  
The Augustan Bridge at Narni: Documentation and Analysis by Laser Survey and 3D Modeling  
**Alberto CUSTODI, Flora SCAIA**
- P. 1505**      **ID 226**  
Morpho-architectural analysis, constructive modalities and structural diagnostics for the restoration of the Church of SS Bartholomew and Stephen in Bergamo  
**Alessio CARDACI, Antonella VERSACI, Davide INDELICATO**
- P. 1515**      **ID 227**  
The twenty-seven buildings of the Littorio rural village in Candiana. Hypotheses of recomposition  
**Enrico PIETROGRANDE**
- P. 1525**      **ID 228**  
Survey and Representation of the complexity of ancient theaters and amphitheatres  
**Giuseppe DI GREGORIO, Angelo MONTELEONE**
- P. 1535**      **ID 229**  
The experience of the journey. Digital technologies and visual itineraries to enjoyment of the city's cultural heritage  
**Elena IPPOLITI, Alessandra MESCHINI**
- P. 1545**      **ID 230**  
Golden Cartelline from the Wall Mosaic of S. Giovanni in Fonte. Remarks and Scientific Analyses on the Constituent Materials  
**Ciro PICCIOLI, Caterina GATTUSO, Valentina ROVIELLO**
- P. 1554**      **ID 231**  
Strategies for the sustainable development of historical town centre and compatible conservation and reuse of the built heritage  
**Giuliana QUATTRONE, Elena GIGLIARELLI**
- P. 1562**      **ID 232**  
Structures for the museumification of underwater cultural heritage  
**Marco RUSSO**

- P. 1572**      **ID 233**  
Architectural and Environmental Compositional Aspect for Technological Innovation in the Built Environment  
**Mario GROSSO, Giacomo CHIESA, Marianna NIGRA**
- P. 1582**      **ID 235**  
UAV Remote Sensing for the Preservation and Restoration of Houses of Worship. Potential and Limitations  
**Margaret BICCO**
- P. 1589**      **ID 236**  
From ruin to hinge of urban renewal: the restoration of the church of St. Demetrius in Ceglie Messapica (BR)  
**Antonio BIXIO, Ippolita MECCA**
- P. 1599**      **ID 237**  
Architecture of Light Case study St. Cross Church in Nin, Croatia  
**Ivanka STIPANČIĆ-KLAIĆ, Davor ANDRIĆ, Anja KOSTANJŠAK**
- P. 1608**      **ID 240**  
Innovative working spaces: the case study of Novartis and the “InNova” project  
**Lorenzo CAPOBIANCO, Giuliana CHIERCHIELLO**
- P. 1616**      **ID 241**  
Sanfelice Palace, the house of a genius: some insights about the geometrical relations  
**Gerardo Maria CENNAMO**
- P. 1625**      **ID 242**  
Toward the “Smart Polis”: methods, tools and strategies of intervention for the sustainable regeneration of historic urban centres  
**Elena GIGLIARELLI, Lu BIN, Luciano CESSARI**
- P. 1632**      **ID 244**  
Remote sensing evaluation of fire hazard: towards operational tools for improving the security of citizens and protecting the environment  
**Carmine MAFFEI, Carmine GAMBARDELLA, Massimo MENENTI**
- P. 1640**      **ID 246**  
Marble sculptures FRP-based reinstating and consolidating practices  
**Ignazio CRIVELLI VISCONTI, Marina D’APRILE, Domenico BRIGANTE, Claudio CIGLIANO**
- P. 1650**      **ID 247**  
New fiber composite materials for Cultural Heritage conservation  
**Giuseppe CHIDICHIMO, Amerigo BENEUCI, Caterina GATTUSO, Alessandro SENATORE, Francesco DALENA, Valentina ROVIELLO**
- P. 1654**      **ID 248**  
Sustainable reutilization of the Pombaline System essentially based on the properties of the so-called “Gaiola Pombalina”  
**António José MORAIS, Alexandra AI QUINTAS**

- P. 1661**      **ID 249**  
The Roman Theatre in Trieste. Digital Analysis and 3D Visualizazion  
**Alberto SDEGNO, Paolo CASARI, Piero MICEU, Marco JEZ, Lisa MINIUSSI**
- P. 1671**      **ID 250**  
Pressure of tourism on heritage and technologies for an inclusive society  
**Valeria MINUCCIANI, Gabriele GARNERO**
- P. 1675**      **ID 251**  
The spatial-temporal journeys and the urban filters  
**Vincenzo CIRILLO**
- P. 1685**      **ID 254**  
New heritage: Architecture and biological sciences  
**Rossella BICCO**
- P. 1691**      **ID 256**  
Ordinary maintenance in the Venice "minor". Problems in nontrivial resilience  
**Piero PEDROCCO**
- P. 1701**      **ID 257**  
HafenCity Hamburg  
**Agrippino GRANIERO**
- P. 1709**      **ID 259**  
Survive the Saracoglu District - Preservation of Architectural Heritage of Ankara  
**Duygu KOCA**
- P. 1716**      **ID 262**  
"School Project EXPO 2015" : LANDesign BREEDING-GROUND SALERNO  
**Maria Dolores MORELLI**
- P. 1723**      **ID 263**  
"Universities for EXPO 2015": LANDesign in Mostra d'Oltremare  
**Sabina MARTUSCIELLO**
- P. 1735**      **ID 265**  
The influence of colors on the sound environment perception  
**Virginia PUYANA ROMERO, Giuseppe CIABURRO, Luigi MAFFEI**
- P. 1742**      **ID 266**  
Additive technology and design process: an innovative tool to drive and assist product development  
**Francesco TAMBURRINO, Valeria PERROTTA, Raffaella AVERSA, Antonio APICELLA**
- P. 1748**      **ID 268**  
Applying Geographical Information Systems for documenting and managing Iraqi archaeological heritage: the case study of the Akre Castle in Kurdistan  
**Angela LOMBARDI, Jambaly MOHAMMED, Abdulkareem SAMAN**
- P. 1758**      **ID 269**  
The recomposition of fragmented objects: the case study of St. Andrea statue at Stiffe, L'Aquila  
**Marco CANCIANI, Corrado FALCOLINI, Mauro SACCONE, Lorenza D'ALESSANDRO, Giorgio CAPRIOTTI**

- P. 1765**      **ID 270**  
Democratic evaluation of architectural heritage  
**Marta BERNI**
- P. 1775**      **ID 271**  
Cultural Landscape: Sintra, the Shock of the Past into the Future  
**Alexandra AI QUINTAS, António José MORAIS**
- P. 1783**      **ID 272**  
My concrete is damaged?  
**Andrea BASILE, Giorgio FRUNZIO, Giuseppe MATTIELLO**
- P. 1792**      **ID 273**  
Build on natural tendencies to strengthen resilience of cultural and environmental heritage  
**Serena BAIANI, Antonella VALITUTTI**
- P. 1798**      **ID 274**  
"Additional services" in the management of Cultural Heritage: the paradox of archeological site of Pompei  
**Fabiana FORTE, Roberta FORMISANO**
- P. 1805**      **ID 275**  
Sponsorship in the enhancement of Cultural Heritage and the role of Creative Industry: some evaluative aspects.  
**Fabiana FORTE Manuela RUPE**
- P. 1813**      **ID 276**  
Signs of popular religiousness in the Southern Piedmont territory. The drawing of votive pillars  
**Maria Paola MARABOTTO**
- P. 1820**      **ID 277**  
Geldo's Castle Palace, at Castellón Province, Spain.  
**Joaquín MARTINEZ MOYA, María Jesús MAÑEZ PITARCH, José Teodoro GARFELLA RUBIO**
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The instructions of s. Carlo Borromeo in the Vistabella church. Castellón. España.  
**Joaquín MARTINEZ MOYA, María Jesús MAÑEZ PITARCH, José Teodoro GARFELLA RUBIO**
- P. 1836**      **ID 279**  
Evolution of techniques in osteoarcheology: a proposal for a new on-field schedule for preliminary study of ancient population  
**Valeria AMORETTI, Vittorio NAZIONALE**
- P. 1848**      **ID 281**  
Naples, the modern living sense. A comparison between residence and society after World War  
**Marco CARUSONE**
- P. 1855**      **ID 282**  
Figura praesentis urbis Nolae: geometric theorems and learned sources in Renaissance's urbanism and in De Nola of Ambrogio Leone.  
**Maria Carolina CAMPONE**

- P. 1864**      **ID 284**  
The dams of Rio Grande's basin (Amelia TR)  
**Fabio BIANCONI, Marco FILIPPUCCI**
- P. 1875**      **ID 285**  
From the acquisition of cartography, the latest methods of representation  
**Vincenzo POLLINI**
- P. 1884**      **ID 286**  
Italian architects and transformations of Tirana, regulatory plans of the new capital in the years 1925-1943  
**Armand VOKSHI**
- P. 1894**      **ID 287**  
New qualities for the revitalization of the ancient villages  
**Mariarosaria ARENA, Antonio BOSCO, Sergio RINALDI**
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Triumph Arch in the archaeological site in Tyre (Lebanon): a new approach to GIS analysis of vertical elements in 3D environment  
**Laura BARATIN, Sara BERTOZZI, Elvio MORETTI**
- P. 1915**      **ID 289**  
Theories and techniques to solve complex systems  
**Antonio APICELLA, Giuseppe D'ANGELO**
- P. 1922**      **ID 290**  
An application of optimization processes in the evaluation of a security basket  
**Maria Cristina MIGLIONICO, Giuseppe D'ANGELO**
- P. 1930**      **ID 291**  
BIOMATERIALS: the synthetic biology applied to architecture  
**Antonella VIOLANO, Ayşen CIRAVOĞLU, Semin ERKENEZ, Veronica MONTANIERO, Francesca VERDE**
- P. 1940**      **ID 292**  
BUILDING WITH WOOD: the summer energy performance according the UNITS 11300:2014-I  
**Antonella VIOLANO, Monica CANNAVIELLO, Antonella DELLA CIOPPA**
- P. 1948**      **ID 293**  
Innovative fence systems as best practice for the sustainable construction site  
**Lucia MELCHIORRE**
- P. 1956**      **ID 294**  
The Basilica of Santa Restituta in Naples. Towards an information and interactive model.  
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- P. 1967**      **ID 297**  
Consolidation with reinforced concrete for the ecclesiastical architecture in l'Aquila (Italy): observations after the earthquake  
**Claudia CENNAMO, Concetta CUSANO**



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**Efisio PITZALIS**
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**Giuliana CHIERCHIELLO, Antonio GESUALDO, Antonino IANNUZZO, Michela MONACO, Maria Teresa SAVINO**
- P. 2021 ID 306**  
Archaeological Environmental Park of Sennacherib's irrigation system (Iraqi Kurdistan)  
**Roberto ORAZI, Francesca COLOSI**
- P. 2031 ID 307**  
Project for the Archaeological Park of Chan Chan, Peru  
**Francesca COLOSI, Roberto ORAZI**
- P. 2041 ID 309**  
Empatic forms for relational spaces  
**Marco BORRELLI**
- P. 2051 ID 310**  
REMOTE SENSING: hightech tool for law enforcement in crimes perpetrated against environment  
**Flaviano TESSITORE**
- P. 2059 ID 311**  
Innovative Strategies for Urban Regeneration in Coastal Areas – the Case Study of the Metropolitan Coast of Naples  
**Massimo CLEMENTE, Eleonora GIOVENE DI GIRASOLE**
- P. 2069 ID 312**  
A Comparative Study of Ottoman and European Bridal Gowns During 18th and 19th Centuries  
**Sema YALÇIN**
- P. 2077 ID 313**  
A generative design algorithm for the architectural design  
**Carlo COPPOLA, Rosa BUONANNO, Vincenzo NIGRO, Andrea DI ROSA**
- P. 2085 ID 314**  
The signage and communication systems in the ancient city of Pompei  
**Sabrina MATALUNA**
- P. 2092 ID 315**  
The archaeological site of Pompeii: multimedia systems' analysis.  
**Maria Grazia GIULIANO**

- P. 2101**      **ID 316**  
Seismic joints: architectural integration and structural safety  
**Caterina FRETTOLOSO, Mariateresa GUADAGNUOLO**
- P. 2108**      **ID 317**  
Floor masonry beams reinforced by BFRG  
**Mariateresa GUADAGNUOLO, Giuseppe FAELLA**
- P. 2115**      **ID 318**  
The Pompeii Artifact Life History Project: Conceptual Basis, Methods and Results of First Three Seasons  
**J. Theodore PEÑA, Caroline CHEUNG**
- P. 2124**      **ID 319**  
The virtual representation of the past.  
**Paola D'AURIA**
- P. 2130**      **ID 320**  
The impermanent project. Animation and 'multiplicative persistence' in contemporary urban space  
**Silvana SEGAPOLI**
- P. 2138**      **ID 321**  
Heritage - Religious buildings in the routes of restoration: the case of the church of St. Gennaro at the elm  
**Roberto CASTELLUCCIO, Veronica VITIELLO**
- P. 2147**      **ID 322**  
Relation between sustainable economic growth and Safety, security in Albania and the region  
**Artur BEU**
- P. 2153**      **ID 323**  
From Pompeii in Nola: the restoration of Mediterranean habitat. The De Nola of Ambrogio Leone.  
**Saverio CARILLO**
- P. 2163**      **ID 324**  
The non-finiteness heritage. A project strategy  
**Francesco COSTANZO, Gaspare OLIVA, Giuseppe DI CATERINO**
- P. 2173**      **ID 325**  
From Borbonic Royal Gunpowder to mouth of the river Sarno: a redevelopment project architectural and landscape  
**Andrea SANTACROCE**
- P. 2181**      **ID 326**  
The rebirth of the water in Rome. Aqueducts and fountains  
**Maria MARTONE**
- P. 2191**      **ID 327**  
Knowledge in Apollonia. The Medieval Monastery and the territory  
**Luigi CORNIELLO**
- P. 2201**      **ID 328**  
Mario Botta, the man's house in the New Stone Age  
**Lorenzo GIORDANO**
- P. 2209**      **ID 329**  
Museum Quarter as the "core of urban balance" in the post-industrial city  
**Elena SHLIENKOVA**

- P. 2222**      **ID 330**  
Roman period survivals in modern farms: the case of Masseria Tuoro in Vitulazio  
**Margherita DI NIOLA**
- P. 2232**      **ID 331**  
The Waterway from the Royal Palace of Caserta to the Royal Palace of Carditello.  
**Federica DEL PIANO, Valeria DI SALVATORE**
- P. 2241**      **ID 332**  
Among smart governance and smart communities. A survey in the city of Milan  
**Nunzia BORRELLI, Davide DIAMANTINI, Giulia MURA, Monica BERNARDI**
- P. 2249**      **ID 333**  
The design for the modification of the Marina and the Sentiero Terramare in Praiano  
**Paolo GIORDANO**
- P. 2261**      **ID 334**  
Istanbul World Heritage property. Representing and cataloguing the material and intangible assets for local sustainable development.  
**Alessandro CIAMBRONE**
- P. 2270**      **ID 335**  
Analysis and Landscape Planning. The Landscape Project of Taburno-Camposauro.  
**Concetta CUSANO**
- P. 2280**      **ID 336**  
The Caserta's Centre: cataloging as an instrument for knowledge  
**Luciana ABATE**
- P. 2290**      **ID 337**  
Virtual architecture: 3D representation in archeology - a new approach to the presentation of ancient architecture –  
**Ciro FERRANDES**
- P. 2295**      **ID 338**  
Design and communication for the Volturno rivers, between Capua and the Mediterranean sea  
**Ludovico MASCIA**
- P. 2203**      **ID 339**  
Knowledge, survey, technology for carbon neutral restoration: from an old hospital to a luxury hotel  
**Paolo GIANDEBIAGGI**
- P. 2311**      **ID 340**  
Italian military engineers in the court of the King of Spain in the 18th century  
**Giada LUISO**
- P. 2317**      **ID 341**  
Neo-gothic influences on the academic architecture of Giovanbattista Patturelli.  
**Concetta GIULIANO**
- P. 2322**      **ID 342**  
Reading the Territory, sign graphics and remote sensing images. The case study of Historic Center of Naples  
**Rosaria PARENTE**
- P. 2332**      **ID 343**  
Digital Invasion at the Royal Palace of Caserta. Telling a story/Telling your story  
**Alessandra CIRAFICI, Manuela PISCITELLI**

- P. 2341**      **ID 344**  
Charles and Georges Rohault de Fleury illustrators and historians of the medieval architecture.  
**Danila JACAZZI, Antonio MENALE**
- P. 2354**      **ID 345**  
Modern churches in the province of Caserta  
**Riccardo SERRAGLIO**
- P. 2364**      **ID 347**  
Images of possible futures. Representing changing landscape  
**Alessandra CIRAFICI, Antonella VIOLANO, Antonio MAIO**
- P. 2371**      **ID 348**  
Urban farming as an eco-oriented tool for redevelopment of urban contexts  
**Raffaella DE MARTINO, Rossella FRANCHINO, Caterina FRETTOLOSO**
- P. 2379**      **ID 350**  
Nisida: integrated and transdisciplinary survey for interpretation of sources  
**Claudia CENNAMO, Ornella ZERLENGA, Salvatore PETRILLO, Domenico PIGNATA, Ciro SCOGNAMIGLIO**
- P. 2389**      **ID 351**  
Architecture and material culture: the construction of the working-class neighborhood of the new Pompei  
**Pasquale VAIANO**
- P. 2399**      **ID 352**  
Beyond the visible Remote sensing and Photointerpretation  
**Francesco MAIOLINO**
- P. 2409**      **ID 353**  
A methodical approach to knowledge the sacred heritage of Aversa  
**Luciana ABATE, Davide MASTROIANNI, Rosaria PARENTE**
- P. 2419**      **ID 354**  
Perception and fruition of open spaces in the historical centers  
**Manuela PISCITELLI, Milena KICHEKOVA**
- P. 2429**      **ID 355**  
Multisensor and multiscale surveying into Pompeii's archeological site. Three case studies.  
**Carmine GAMBARDELLA, Nicola PISACANE, Alessandra AVELLA, Pasquale ARGENZIANO**
- P. 2469**      **ID 356**  
Metropolitan Strategies. Urban planning scenarios for a territorial system  
**Giuseppe GUIDA**
- P. 2478**      **ID 357**  
Smart Planning  
**Ottavia GAMBARDELLA**
- P. 2489**      **ID 358**  
THE MUTABLE VISION: The study case of Montesanto Metro Station  
**Elena DI GRAZIA, Giuliana CHIERCHIELLO, Valerio PALMIERI**
- P. 2498**      **ID 359**  
"Environmental networks" as complex management tool of the urbanized territory  
**Raffaella DE MARTINO, Rossella FRANCHINO**

- P. 2505**     **ID 360**  
Urban Regeneration - Largo Ex-Gesuitico - Piazza A. Moro - Ortanova (FG)  
**Gianluca CIOFFI**
- P. 2512**     **ID 361**  
Evolution of design and application of a method  
**Gilda EMANUELE**

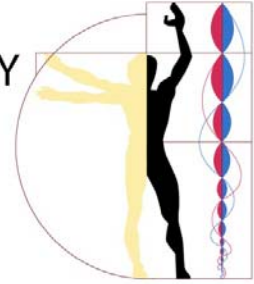
## **Preface**

The theme of the thirteenth Forum “Le Vie dei Mercanti” aims to investigate the complex relationship that develops between technological innovation, knowledge, enjoyment and protection of cultural heritage and the landscape. This leads to the need for an international multidisciplinary comparison in order to explore the questions and issues that are being debated not only in academia, but also among those who govern, manage and control Public Administrations, Institutions and businesses.

The subtitle specifies the macro areas: Mind, intended as both speculative thought as well as the preparation of a methodological process; the subject who investigates, establishes an inescapable destiny with the object analyzed at different scales of analysis, from the architectural structure and design, to the infrastructure and the landscape; Knowledge, as the historicizing of the state of the art reached by the disciplinary skills, integrated with those of material culture, humus generative of innovation for the formation of a human capital that continues to grow; Experience, the representation and sharing of results obtained with good practices, exemplary and paradigmatic, as patrimonial value for humanity to achieve a better quality of life and places created working with Art.

The conference is open to multidisciplinary experiences on one or more of the proposed themes. Scholars are invited to present research on either the theoretical and methodological aspects or concrete applications carried out on these issues.

*Carminé Gambardella*



## Contemporary design drawings as cultural heritage: interpretation and communication. Towards a digital archive of Rosani's industrial projects.

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### Abstract

Contemporary design drawings represent an immense and quite complex cultural heritage to be interpreted, communicated, preserved and publicised. Digital technologies - and the convergence they provide - have much to offer, for example in safeguarding the iconographic heritage ascribed to the field of so-called minor architecture, otherwise in danger of oblivion.

Among the prerogatives of digital representation, archive drawings could be used to create models, animations and dynamic interactive exploration tools, which could then be applied to selected examples. This methodology would allow us to reconstruct different design hypotheses, to break down buildings into thematic interpretations and to provide access to otherwise inaccessible buildings.

This essay intends to develop these considerations and to propose applications for digital technologies in relation to the Rosani Industrial Architecture Studio Archive, our case study. The Rosani Architecture Studio was founded by Nino Rosani, who received his training in the technical department of the Lancia automobile company in Turin, and later taken over by his son Paolo.

In continuity with Nino's prior experience, the studio was mainly involved in projects for major and medium-sized industries based in Italy and abroad. It obtained prestigious assignments and collaborated with several masters of contemporary architecture, such as Giò Ponti on the design of Lancia Office Building in Turin (1954-'57).

**Keywords:** 3D modeling, digital animation, design drawings, digital archive, Rosani's archive

### 1. Introduction (Roberta Spallone)

Architectural design archives of the 20th century are probably the latest and the hugest collections of architectural documents on paper. Their conservation depends largely on the discovery, analysis, comprehension and interpretation of their value as a useful heritage to understand the historical-architectural period in which they arose and to preserve their memory.

Knowledge is so the motive to their safeguard, study and communication.

Archives produced by great masters of the XX century are usually digitized: their drawings on paper are shared in the web at scholars' disposal, although the limits due to the low quality of photo-reproduction and visualization, to the shortage of tools of digital archives for measure and scale, and to the lacking standardization of metadata. In case that archives were produced by the so-called "minor" architects, even economic reasons related to the preservation and the dissemination become often unchallengeable. In this way, too many drawings – as in the case-study of this paper, risk the oblivion because they are unknown, usually roughly catalogued, lost in storages in public and private institutes, like the case-study of this paper, which consists of 138 linear meters of documents (as stated by the *Sistema Informativo Unificato delle Soprintendenze Archivistiche SIUSA*), guarded in the Laboratorio Beni Culturali (Cultural Heritage Laboratory) at the Politecnico di Torino.

Doing choices up against such hefty collections is essential regarding projects to be enhanced, contriving a real narrative process that could reveal the interpretation of the architect's work in its entirety by an accurate exam of the sources. Such enhancement could take advantage firstly of the graphical analysis tools towards a deeper knowledge of geometrical, proportional and modular matrices of the projected building, secondarily of the three dimensional modeling as opportunity of synthesis and geometrical, architectural and thematic interpretation. Furthermore, the possibility to create itineraries around and inside the virtual model or, even more, to allow users free explorations could give fresh views of the object.

The digital reconstruction could be referred to works considered emblematic or exemplar within the architects' activity, or to buildings that have been demolished, transformed or unfaithfully realized in comparison with the original design idea, even to inaccessible structures because of their use – in the case of industrial buildings such problem is particularly considerable. The different morphological hypothesis regarding previous phases of executive processing could be evaluated and explored, even contemplating their territorial impact.

The case study and digital strategies for its conservation, interpretation and communication are the subject of the PhD thesis by Francesca Paluan, supervised by prof. Roberta Spallone and prof. Chiara Aghemo.

## 2. The state-of-the-art: digital archives (Francesca Paluan)

Archives created by architects and engineers since the 20<sup>th</sup> century are unique and significant sources for scientific research, in relation with multiple disciplines: history of architecture and representation, conservation, urbanism and landscape. If they are considered from the strict archival point of view, they belong to the wide category of private and professional archives, upon which the Archival Superintendences apply protection and safeguard activities.

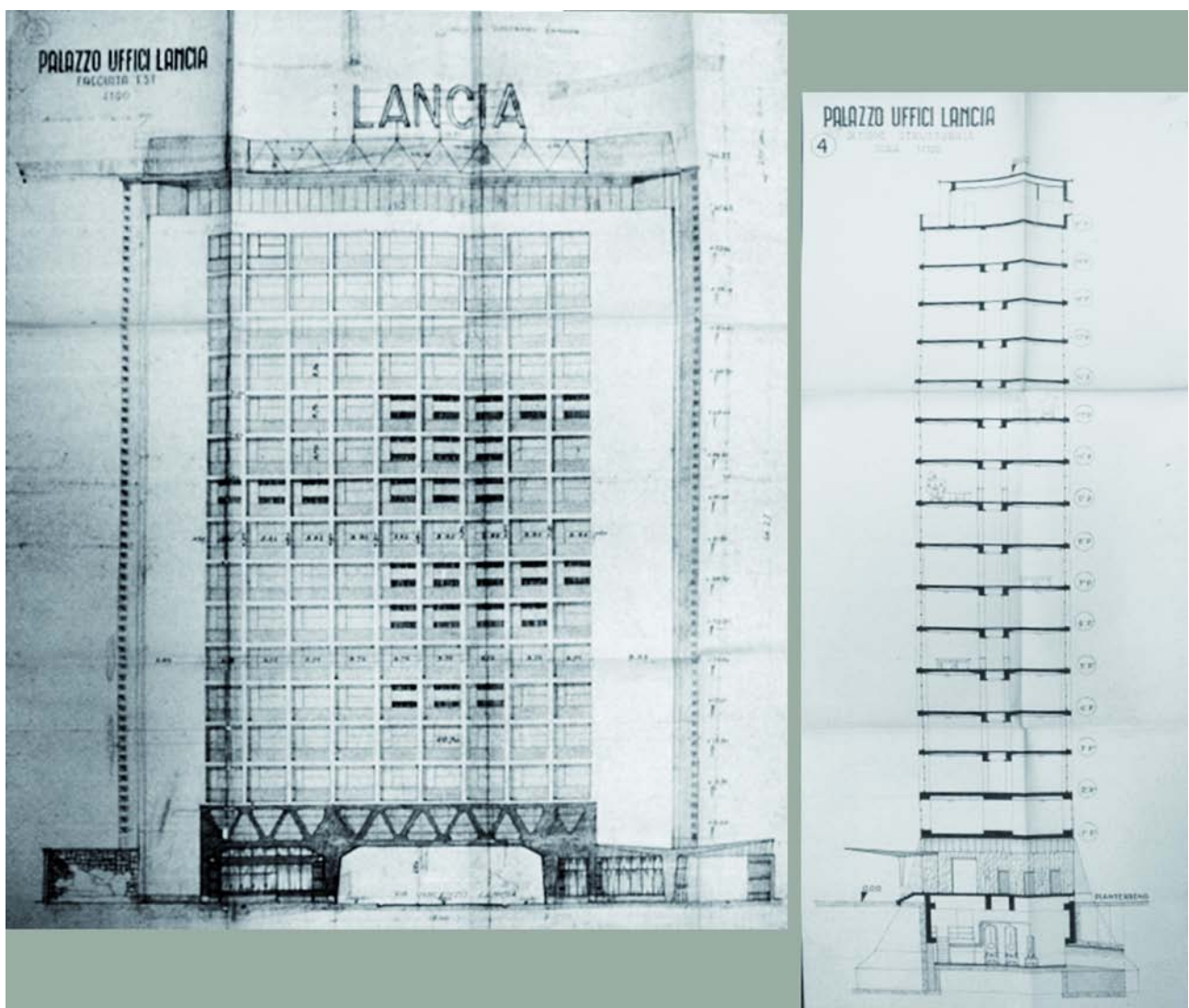


Fig. 1: Lancia Office Building, 1954, elevation and cross section (Laboratorio Beni Culturali - Politecnico di Torino)



Contemporary architectural archives constitute more than a documental heritage, recently recognized and validated: the first exhaustive and persuasive definition of "Architectural document" was formulated only in 1982, in which clarification architectural drawings belong to [1]. Since the end of the Seventies, effectively, the principal North-American and North-European institutions engaged in the knowledge and diffusion of Architecture are working hard and more carefully into conservation and enhancement of contemporary planning drawings, which need specific standards for their description, preservation and fruition guaranteed by international associations, like the ICAM and the ICA since 1979.

The materials collected in contemporary architectural archives, in their physical components and iconographical message, constitute a heterogeneous documentation, whose analysis is sometimes too complicated. The use of traditional materials is associated to the employment of new supports, like polyester and acetate films; the iconographical message is also devolved to different graphical techniques, from the most conventional ones - like inks and lead - to the more recent ones - like halftone screens. Furthermore, architectural archives include an overloaded, and sometimes redundant, *corpus* of copies, coming from the need to modify the project and to show it to the different subjects involved in the realization of the building. The traditional techniques of reproduction, like the use of the contact paper upon which the drawing is retraced, have been supplanted by the recent techniques of photo-reproduction making possible the mechanization of the copying process.

Contemporary architectural archives, as a documentary evidence, contain relations which cannot easily be read and contextualized because of the documents organization: documents often find a collocation threatening and making difficult the analyses of the planning path because of the archival necessities, the lacking adequate spaces and the archival bound defined by the producer. According to the archival science, giving a new order to documents is forbidden even if it could be helpful for their analyses, so the use of digital databases allows the contextualization of the archival data, in order to elaborate information and acquire relations. The digital database runs at microscopic scale, when it is applied to the archival unit containing the single project; at macroscopic scale it makes possible some inconceivable operations within analogical archives: the cross research and the connection between different documents and archives.

The digitation of contemporary architectural archives becomes one of the best practices of sources communication, making possible the visualization of the original documentation through remote mode, and of the preservation, reducing direct manipulation. This process has been started since the beginning of the 21<sup>st</sup> century by institution preserving contemporary architectural archive, that have benefited from this way: low cost for the digital documents production; the sharing of sources to a wider public; the possibility to underline relationships inside and outside the archive group. However, the use of digital images not always pledges a high definition during the images visualization, inducing the loss of resolution and relationship between scale and content, and problem of orientation. The digitation, moreover, supposes a constant update for data, software and hardware in order to prevent the continuous, inexorable and inevitable process of technological evolution, from which organizations and individuals cannot escape without risking the loss of accessibility of contents and the guaranties of the sources integrity.

The digitation of architectural archives is also a favorable management methodology to the new policy of sharing documents, but digital archived appeared ten years later the use of automatic design software in architectural firms. Digital files risk to remain silent if they are not translated in the analogical form as physical traces, or if their format is not changed into others more popular (.pdf, .tiff, .jpeg, .png) or they need a



**Fig. 2:** L'Oréal-Saipo plants in Settimo Torinese, 1959, perspective view (Laboratorio Beni Culturali - Politecnico di Torino)

hardware that can support their original format (.dwg). Probably, digital archives were born also as consequence of digital files production during the planning phase: institutions collecting contemporary architectural archives mobilized their efforts in digitation at the beginning of 21<sup>st</sup> century, adopting different solutions because standards about format, description and catalogue had not been established yet [2].

At the same time that projects about the digital archives production and preservation were financed by European Community - like Gau:di programs (the first one in 2002 – '04 and the second one in 2005 – '08), North American museums, archives and archives/museums of Contemporary Architecture managed the same research, coming to same conclusions: the need of interdisciplinary actions between archivists, architects, restorers and computer technicians; the need of a digital format "preserving" the original characteristics of documents and making it usable by the public in the same time, as best it can; the impossibility to foresee how much technological evolution could be a double-edged sword about preservation and enhancement strategies; the reach of change conveyed by ICT from a static to a dynamic model, made possible thanks to users. In this sense, the development of a network for contemporary architectural archives represents an auxiliary tool not only for institutions engaged with data management, but for the users too, who could have a great heritage at their disposal upon which an individual methodology of analysis could be applied.

Archives network becomes indispensable in the Italian situation: the archival heritage is diffused in the territory, collected in different kinds of centers, like the institutional ones – State and Municipality archives -, the specialized ones – the architectural museums -, and research centers – universities, academies, etc. Their coordination is guaranteed by the *Associazione nazionale Archivi di Architettura Contemporanea* (AAA/Italia) since 1999, which organizes census, conferences and expositions.

This polyedric model finds a digital collocation in the portal *Archivi degli Architetti SAN (Sistema Archivistico Nazionale)*, which has involved in the unitary access to information about an increasing number of archives created by engineers and architects since 2009. As declared in the homepage [3], "the portal, promoted by the *Direzione generale per gli Archivi*, on the basis of a national project previously begun, is the result of a strict collaboration between Archival Superintendences, Regions, cultural Institutions and Universities which have directed cooperatively safeguarding and conservative actions for such archives risking the dispersion long since".

The portal is configured as the access point for non-experts to archival databases, but also as a place of confluence of the results from multiple activities, executed for archival heritage by different institutions presided by the Archival Superintendents. The resources on which the portal is based therefore derive primarily from the census coordinated by the Regional Superintendences, with the addition of inventories and digital images of drawings and objects. Databases, images, multimedia, interviews and historical footage produced by *Istituto Luce* are now available on-line and were elaborated by the Regions – in particular by Piedmont and Lombardy -, Athenaeums like Politecnico di Torino and Politecnico di Milano, cultural and training institutions like the Accademia di San Luca in Rome, the Brera Academy of Fine Arts in Milan and the Academy of Fine Arts in Venice, the Archivio del Moderno in Mondrisio, the CASVA (Centro studi arti visive) in Milan, the AAA/Italia, the Fondazione MAXXI, the Association of Architects in Rome [4].

The portal has several access key-words as the protagonists' biographies, the guided tours, and projects allowing both to start easily a basic search about "light" archival contents, or a more specific search, outlining connections between materials described in the SAN. The portal has an editorial and graphical aspect obligated and a reduced possibility to use particularly innovative technological solutions: the rules for the accessibility of public websites limit the readability of the information [5]. Its value does not lie therefore in the modern technology employed or in the aesthetic results, but in making easily available a really significant amount of data and in showing the many connections and peculiarities of such a very little known and heterogeneous documentary heritage.

A thematic section of the portal that deserves mention is related to the Archives of Enterprise (*Archivi di Impresa*) [6], in which users can find architectural documents such as historical evidence of the transformations undergone by productive buildings in the secondary and tertiary sectors.

The portal of the Architectural Archives, therefore, was born because of the need to enlarge the knowledge of a widespread heritage, but very inaccessible and at the high risk of dispersion; it is also planning an evolution aimed in particular on two directions: widening the "specific funds contained in the technical offices of many institutions, even the municipal ones, the public and private companies" [6]; connection to other European archives.

### **3. Interpretation and communication of digital archive's contents: the Representation discipline's contribution (Roberta Spallone)**

As said before, the simple digitization of archival drawings seems not to be sufficient to transmit the potential of knowledge and meaning that it was caught by the direct study of the sources.

The knowledge data, resulting from documentation analysis, needs to be interpreted, represented, and communicated.

Digital models are the most useful database for collecting and synthesizing these analyses.

The extreme care in implementing 3D reconstructions is the final result of a new attention paid by the stakeholders to the communication capability of information technologies, both as for the large audience and the narrow scientific community. The simplest language is required to the producers of these models [7], in order to share and diffuse information in a readily understandable form to a wide-ranging spectrum of public.

Thanks to these models, the era of graphic papers that only specialists can decipher is over.

In the present research project, we propose methodologies and techniques that can actively contribute to widen the knowledge and the understanding of Archival Drawings intended as Cultural Heritage and support its sharing, in the firm conviction that safeguard and fruition should go together.

The analytical activities start from reconstruction, through the re-drawing of the archival drawings, possibly supplemented by other documentary sources, which can enrich the mainly geometric data arising from technical drawings, and could provide information on materials, colors, building techniques and characteristics of the original surrounding environment.

When the building is still in existence, direct surveys, extended to the context, provide the exact measures which can be compared with the dimensions of drawings.

During this representation phase, the re-drawing of plans, elevations and sections involves the check of projective correspondences, aimed to three-dimensional synthesis, and the possible need to interpret inconsistencies and blanks. In this way the act of modeling may enhance knowledge acquisition, not only for others, but for the modeler as well [8].

Regarding the next stages of modeling, the drawings created are the basis of the "blue-prints" technique, in which the two-dimensional drawings which write-up archive drawings in vector format, are placed on orthogonal planes in the space of the digital work, so they can directly infer the geometric and dimensional references.

2D drawings could also be the basis of graphical analysis, inspired to Pagnano and Docci's methods [9], aimed at finding regulator patterns, harmonic proportions and modular grids that belonged to the cultural background and methodology of architects in the period considered.

The transformation of several technical drawings into a 3D digital model is a process which changes one model into another and deserves some attention. It is, as a matter of fact, not a simple variation without alteration of contents, but it modifies, each time, "the wealth of the model, its expressive potentiality. In fact, the transmutations of the models are moved by the interpretative intent of the scholar, and they converge, therefore, toward an abstract model... that we can identify in the project idea" [10].

Since all the models are simplifications and schematizations of the reality, there is always a difference between the real and the level of details included in the model.

This is true not only in comparison with the reality: 3D model level of detail, compared to the ratio between scale and contents of the original 2D drawings, conveys the geometric simplifications necessary to avoid excessive modeling times, considering the distance from the object of projection's centers, static or dynamic, to be set in the visualization phase [11].

The creation of a 3D digital model offers, as a result, infinite possibilities of observation - which means also survey -: from the objective visualization of a cylindrical projection, orthographic or isometric, to the subjective visualization of a conical projection, perspective [12]. The model thus becomes an essential tool to



**Fig. 3:** L'Oreal-Monsavon plants in Aulnay-sous-Bois, 1958, perspective view (Laboratorio Beni Culturali - Politecnico di Torino)

check and control the validity of reconstructive hypotheses and the congruence between the building elements.

During the render phase we prefer to apply plaster material to the opaque parts of the model and glass to the transparent ones and eventually differentiate its colors, according to build or natural elements, and finally to light the model with sunlight.

In any case we share Gaiani's opinion: "the fundamental attribute of the digital models is not as much that of photorealistic simulation of the reality, or of formal prefiguration or structural and/or functional simulation mean, as that of being capable to function as a real virtual prototypes" [13], endowed with similarity of behavior and performance, foremost topologic, geometric and perceptive, capable to allow us to observe, to simulate and to analyze the project in a much better way than the analogical technology.

As Moriconi said, and in a sense foresaw, over a decade ago, with info-graphic support, digital drawing simulates a hypothetical reality, goes beyond the limitations of the static and allows interaction with any type of sign. Through the creation of virtual images, info-graphic technology represents what is perhaps the most appropriate tool for the interpretation of the complexity of reality [14].

Thanks to the most recent technological developments in the field of computer graphics, dynamic and hyper-medial visualizations have burst on the scene of architectural representation methods, traditionally static. Several digitally based techniques, such as 3D modeling, animation, montage, virtual and augmented reality are establishing as primary emerging modes of architectural representation and could be effectively applied to the communication of archival heritage.

The ability to access the fourth dimension, through the construction of a sequence of images, constitutes a specific prerogative of digital representation, which goes beyond the static constraint imposed by conventional methods of representation [15].

In this phase of the research, the production of walk-through and fly-through is evaluated to allow scholars to explore the 3D modeled buildings.

#### 4. The case study "Rosani's Archive": characteristics of the drawings and materials (Francesca Paluan)

##### 4.1 Rosani's Industrial Architectural Studio, Turin

The case study, on which an evaluation about the most appropriate strategies of enhancement and preservation is carried out, is the professional archive produced by Nino and Paolo Rosani, preserved at the *Laboratorio di Beni Culturali* at the *Politecnico di Torino*, since November 2011. It had been one of the most prolific industrial architectural firms in Piedmont, operant since 1958, when it was founded by Nino Rosani (1909-2000), until 2010, when his son Paolo (1939) gave up working. The Industrial Architecture Rosani's Studio worked for big names of Italian firms, designing factories, industrial plants and offices not only in Italy but also abroad. Nino started working as an architect after he had worked in the technical department of the Lancia automobile company in Turin for thirty years, directing the Systems and Constructions Service with the responsibility of the design and maintenance of the Italian and foreign offices. The task that gave him fame was committed in 1954 by the same Giovanni Lancia, for whom Nino planned the *Palazzo Uffici*

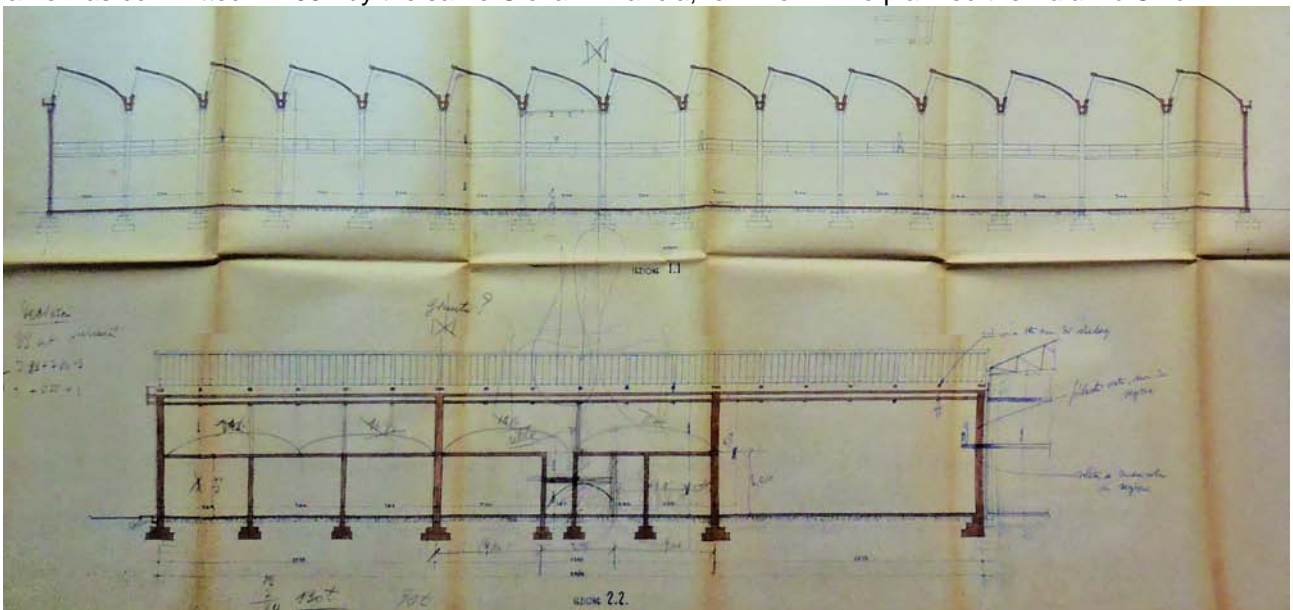


Fig. 4: L'Oreal-Monsavon plants in Aulnay-sous-Bois, 1958, sections (Laboratorio Beni Culturali - Politecnico di Torino)



*Lancia*, known as the Lancia skyscraper (Figure 1), in collaboration with Nino Gio Ponti, Antonio Fornaroli and Alberto Rosselli [16]. The building, now for residential use, at the time was the second highest structure of Turin (after the *Mole Antonelliana*), constituted by 17 floors, conceived to overpass Vincenzo Lancia Street as a liaison - bridge between the two lots occupied by the factory. After the enterprise and the open of a professional studio at the civic number 12 in Corso Tassoni, Nino remained in contact with the Lancia family, receiving private commissions in the aftermath.

Since 1958, Nino Rosani had received important assignments for the city of Turin, the planning of INA INCIS houses in Corso Sebastopoli, in collaboration with the *Studio Architetti Riuniti* (Carlo Alberto Bordogna, Franco Campo, Carlo Graffi, Francesco Dolza) directed by the architect Carlo Mollino [17].

Another great work he received was the plant for L'Oréal-Saipo (1959) in Settimo Torinese (Figure 2), whose design was initially undertaken by Pier Luigi Nervi [18]; it is an important example of the way in which Rosani was able to manage so large spaces dominating them with shed roofs [19], approached by elevated structures for office use. This scheme resulted from the combination of the horizontal manufacturing structure with the vertical administrative one was recalled the following year by the same Rosani for L'Oreal-Monsavon (1958) in Aulnay-sous-Bois (Figures 3-4), made in collaboration with the French architect Alain Leon. Rosani planned other representative offices for L'Oréal in the city center of Turin, Rome, Padua, Naples, Messina, Madrid and Lisbon, caring even the interior design. In the first decade, Nino was involved with the planning of other extended structures for the big industries, like the saltworks in Araya (Venezuela), the tanneries CIR in Pescara, the new headquarters and the Centre of Research CSELT for SIP-Telecom in Turin, the Centre of Research for Pininfarina in Grugliasco. At the same time, he was working for medium and small enterprises, above all in Piedmont - i.e. Colongo, Carello, Universal, De Coster (Figure 5) -.

Nino was flanked by his son Paolo at the beginning of the Seventies, as proved by the correspondence; in the same years the study was transferred into a new address (51, Corso Galileo Ferraris, Turin). Even at that time they undertook other important commissions, including establishments expansions designed and made in the previous years (for example CSELT and L'Oréal-Saipo) and new headquarters in San Giorgio Canavese and Cambiano, the Wind Tunnel in Grugliasco for Pininfarina [20].

#### **4.2 Rosani's Archive: drawings and materials**

Nino and Paolo's intense activity, from 1958 until 2010, is collected in their archive, donated in 2011 by Paolo Rosani and his wife to the Politecnico di Torino. The archive, inserted into SIUSA (*Sistema Informativo Unificato per le Soprintendenze Archivistiche*), is considered expression of historical and cultural interest.

Overall, the preserved documentation consists of nearly 300 planning practices, numbered and collected by the same architects. In most cases, for each practice there is a binder containing the technical documentation, correspondence and photographic material, which corresponds to a container with graphic documents. Unfortunately, some of the documents, especially those related to Nino's beginning as an architect freelancer, had been lost or drawings are rolled miscellaneously, without any documentation.

Rosani's archive collects only preliminary plans and executive drawings: sketches, studies and conceptual drawings are missing, perhaps trashed by the same architects once the project had been completed, refused or the construction had been started. The lack of this type of drawings is indicative of the architects' extremely rational "personality", whose interest was only dedicated in storing the technical drawings, useful for the building; this aspect, however, determines a gap for the planning knowledge, so it is not possible the analysis of the first stage generating the idea and the evolution of the project. Even second thoughts, especially about the size of the building in its interior spaces, are present only in copies of the executives stored separately within paper documents.

Among the drawings preserved, there are those related to the informational documentation: maps, geographic maps, floor plans, surveys, geological and hydrogeological studies. In sporadic cases, there are preliminary drawings to be approved by the customer and to have permissions or building concessions. The preponderant part of the info-graphic material regards the executive plans related to different parts - architectural, structural and plant - necessary for structural calculations, cost estimates and for the execution of the building. Documents drawn are definitive plans, technical drawings about the architectural and structural aspects, the electrical, plumbing and heating system, and detail drawings of architectural parts or completions.

The techniques of representation of the executive compositions are plans, elevations, sections and axonometry; on the other hand, projects about a building or an interior preparation were communicated through photomontages or perspectives drawn on numberless and sometimes in watercolors or pastels.

The archive contains Rosani's drawings whose execution covers a time span of fifty years, during which the materials and techniques of photo reproduction had been changed, as evidenced by the documentation kept. The great variety of supports and graphic techniques is common among the contemporary architectural archives, but the knowledge of contemporary materials is perilously in danger: often, architects used alternative media to paper and contact paper, so the recognition is difficult even by experts, archivists, conservators and architects themselves. Rosani's archive collects, among many contact papers, a considerable amount of radex, unknown by young architects, but used until the previous two generations.

This type of documents is the product of the heliographic reproduction technique on contact paper or on polyester film: the method allows making copies characterized by gray or brown signs on a brownish-gray background [1].

Usually transferable films and halftone screens are also applied to the translucent supports, not interfering with the reading of the iconographic message, although they are one of the causes of the drawings degradation. The interaction between materials and graphic and reproduction techniques with the environment, in fact, causes the onset of chemical and physical degradation. The preservation of a contemporary architectural archive, therefore, appears to be extremely complicated not only because of the great variety of materials used, but also because each archive is unique: therefore, the application of the guidelines devices is only one of the operations to be performed, in addition to the evaluation of the previous conditions of the archive.

Rosani's Studio of Industrial Architecture used also computer-aided design software in the last decade of activity; only prints are preserved in the archive, while the digital media (for example floppy, CD, hardware), and consequently the files too, are not present.

For reasons of space, drawings are stored in separate containers: each project, therefore, appears to be split into its info-graphics data and complementary data (for example technical, etc.): this physical separation of documents can be virtually filled, conducting a data analysis for the reconstruction of the project and for the following phase - the synthetic model development - as the result of an interpretation, with the intent to communicate the documents.

## 5. Meta-project of a digital archive for Rosani's drawings (Francesca Paluan)

Rosani's archive collects a historical and cultural heritage in danger of dispersion and forgetfulness: consultation is reserved for few experts, a non-specialist potential audience cannot immediately understand the data, the planned buildings are earmarked mainly for the industrial use, so they are difficultly communicable because they represent an economic and social logic little different from the Cultural Heritage is generally subjected to. The hypothesis of a physical exhibition of the drawings considered the most exemplar would be a temporary event that will surely enhance the archive, but then it could not guarantee a return of interest from the public.

These reasons let hypothesize and, if possible, apply the strategies considered the most suitable for the enhancement and the safeguard, through the representation techniques and methodologies for the interpretation and communication of the projects, and through the physical conservation techniques for the exposition of the drawings. These objectives, under development, will be the basis of a meta-project Rosani's archive will be made ready for.

The importance of ICT in the communication phase of Cultural Heritage is renowned; referring to the case study, ICT aided the analysis of the projects.

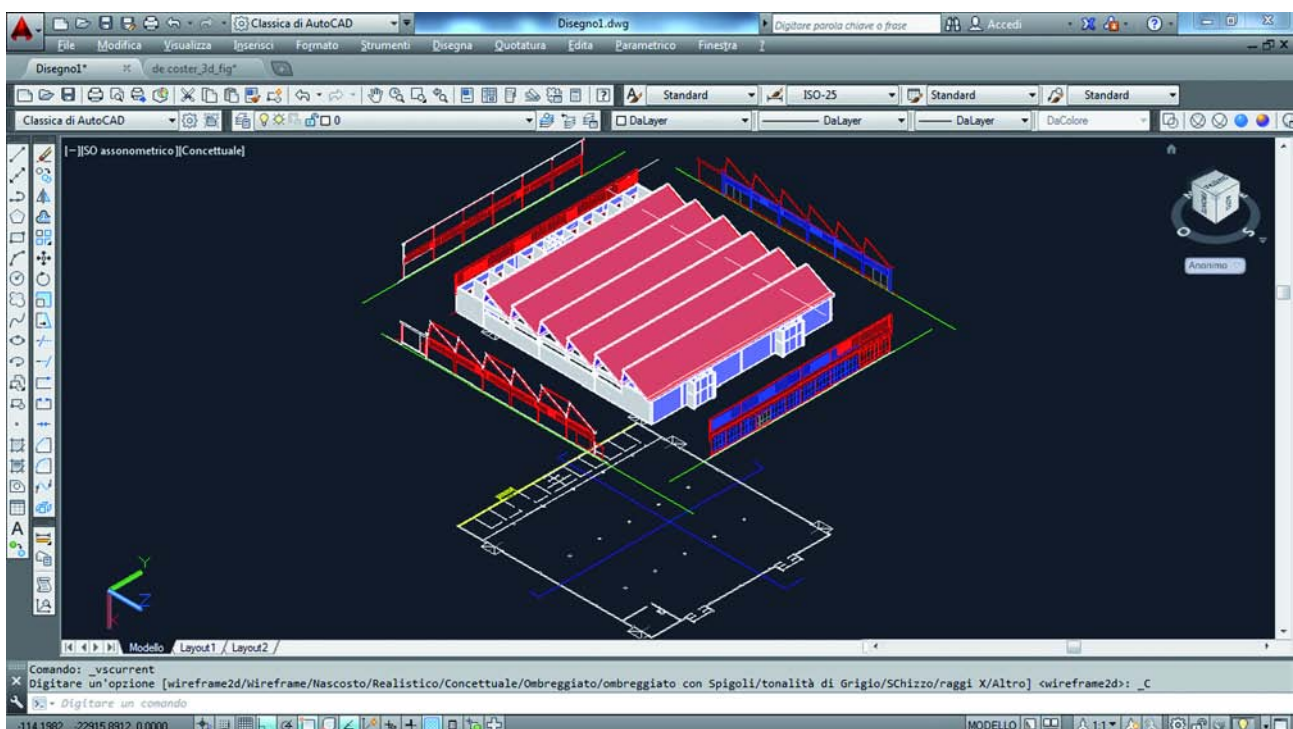


Fig. 5: Blue-prints and 3D modeling of De Coster plants (Digital drawings and 3D model by Francesca Paluan)

The magnitude of the archival collection obliged to focus only on some of the most significant projects by Nino Rosani. The selection was conducted according to certain parameters: the exemplarity of the plans; the existence of design variants; the inaccessibility of the existing building (because it is still in use), and the importance of transformations and expansions on the structure over time.

The method to be pursued, adopted at the end of the consultation of all the projects by Nino Rosani and of a part of Paolo's projects, consists of a detailed analysis of the documentation, drafting a form containing the metadata related to the drawings. These forms are related to a more concise inventory in which all the projects are included and divided into categories according to the typology of customers. Such a division, as well as outlining the different types of use of the buildings planned by the Rosani during their business, has given a virtual order to the archival units, crucial to make emerge how much the first commissions have induced the Rosani's architectural Studio fortune: the first customers, in fact, turned repeatedly to Rosani not only for extensions of their establishments, but also for other types of works (for example, the accommodation for the SIP-Telecom workers in Gressoney, Aosta).

The projects selected as case studies become, therefore, the subject of a trial communication using the tools of the digital representation. Among them, the project for L'Oréal - Monsavon in France and L'Oréal - Saipo in Settimo Torinese were preliminarily selected for several reasons: as confirmed the exemplarity of these plans as stated by bibliographical references [21], the French case presents a transformation of the structure different from the plan at our disposal; in the Italian case, however, the preservation of all documentation, including the various design solutions and the two following expansions, allows to reconstruct the architectural evolution both in terms of design and through the comparison with what was actually achieved.

The phase of re-drawing the project is preparatory to the following modeling, creating models of cognitive synthesis of the documentation and processing thematic readings paths. Buildings surveyed, in fact, can be decoded according to different interpretations: the geometric and dimensional one, taken from the Drawing disciplines, can support a historical reading, which deals with the changes of the building and of its different uses over time.

These different interpretations are possible because of the peculiarity of the case study: industrial architecture, in fact, has a particular propensity to the critic analysis in its historical, manufacturing and social meanings. The inaccessibility to the structures constitutes a further reason for which the modeling, as well as being a heuristic practice, becomes indispensable for the project communication. The virtual model, therefore, has been already conceived in its future online presentation to a non-expert public, shown like an "experience" through the use of animation and the possibility to run virtual visits, assisted and not. The addition of the fourth dimension becomes, therefore, the life-giving and participant element, in line with the changes undergone by the information technology and web communication: from the static meaning of the 2.0 web to the dynamic meaning of the 3.0, where the user from passive spectator becomes actor, moving in its own scene and actively consulting the system.

Another possibility of communication using ICT involves the employment of the Augmented Reality (AR): the virtual model is displayed on a mobile devices monitor. Presumably, the ARtags will be installed in the real archive, so that they allow the immediate understanding of the content in the folders and, therefore, to convince users to continue the consultation and exploration of the material, both in its analog form and in that digitized.

This proposal, therefore, intends to add a new interpretative value to those found in digital archives: not only documents scanned will be viewable, but the purpose is to make consultable the drawings, allowing to measure the scanned drawing in its original size when the dimensions are missing; synthesis models will be shared on the network and made surfable in the way they were conceived; virtual reality will be applied to the original document, offering a snapshot of the plan through the AR techniques. All these operations require the primary objective of the enhancement of documents, avoiding providing further degradation, and the increasing of exposure and knowledge of such a cultural heritage at high risk of misunderstanding and loss.

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